Service Manual

74 ST17 /02B /02G

ST-17 FN UBL KBL KGL KKGL

Stereo tuner

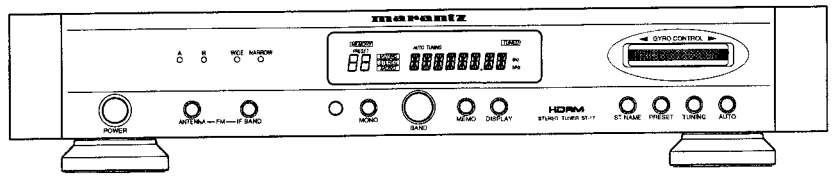


TABLE OF CONTENTS

SECTION	PAGE
1. TECHNICAL SPECIFICATIONS	1
2. BLOCK DIAGRAM	2
3. SCHEMATIC DIAGRAM AND PARTS LOCATION (Pattern Side)	3
4. EXPLODED VIEW AND PARTS LIST	11
5. SERVICE PROGRAM	14
6. TUNER ALIGNMENT PROCEDURES	15
7. ALIGNMENT AND TEST POINT	18
8. MICROPROCESSOR SPECIFICATIONS	18
9. ELECTRICAL PARTS LIST	21

Please use this service manual with referring to the user guide (D.F.U) without fail.
修理の際には必ず取扱説明書を準備し操作方法を確認の上、作業を行って下さい。

marantz®

model ST-17

PCS 98 460

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS :

Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order :

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature : any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

USA

MARANTZ AMERICA, INC.
440 MEDINAH ROAD
ROSELLE, ILLINOIS 60172
USA
PHONE : 630 - 307 - 3100
FAX : 630 - 307 - 2687

CANADA

LENBROOK INDUSTRIES LIMITED
633 GRANITE COURT,
PICKERING, ONTARIO L1W 3K1
CANADA
PHONE : 905 - 831 - 6333
FAX : 905 - 831 - 6936

EUROPE / TRADING

MARANTZ EUROPE B. V.
P.O.BOX 80002
BUILDING SFF2
5600 JB EINDHOVEN
THE NETHERLANDS
PHONE : +31 - 40 - 2732241
FAX : +31 - 40 - 2735578

PROFESSIONAL **USA**

SUPERSCOPE TECHNOLOGIES, INC.
MARANTZ PROFESSIONAL PRODUCTS
1000 CORPORATE BLVD., SUITE D
AURORA, ILLINOIS 60504 USA
PHONE : 630 - 820 - 4800
FAX : 630 - 820 - 8103

PROFESSIONAL **CANADA**

TC ELECTRONICS CANADA LTD.
540 FIRING AVE.
BAIE D'URFÉ, QUEBEC H9X 3T2
CANADA
PHONE : 514 - 457 - 4044
FAX : 514 - 457 - 5524

KOREA

MK ENTERPRISES LTD.
2F SHINHAN BLDG., 247-17 SEOKYO-DONG
MAPO-KU, SEOUL
KOREA
PHONE : +82 - 2 - 323 - 2155
FAX : +82 - 2 - 323 - 2154

BRAZIL

MARANTZ BRAZIL
CAIXA POSTAL 21462
CEP 04698-970
SAO PAULO, SP, BRAZIL
PHONE : 0800 - 123123 (Discagem Direta Gratuita)
FAX : +55 11 534. 8988

THAILAND

MRZ STANDARD CO., LTD.
746 - 754 MAHACHAI RD.,
WANGBURAPAPIROM, PHRANAKORN,
BANGKOK, 10200 THAILAND
PHONE : +66 - 2 - 222 - 9181
FAX : +66 - 2 - 224 - 6795

HONG KONG

FORWARD INTERNATIONAL CORP., LTD.
3/F., BLOCK-B, WO KEE HONG BLDG., 585-609
CASTLE PEAK RD., KWAI CHUNG, N.T.
HONG KONG
PHONE : +852 24942033
FAX : +852 24101656

AUSTRALIA / NEW ZEALAND

SCAN AUDIO PTY. LTD.
52 CROWN STREET, RICHMOND 3121
VICTORIA
AUSTRALIA
PHONE : +61 - 3 - 9429 - 2199
FAX : +61 - 3 - 9429 - 9309

TAIWAN

PAI - YUING CO., LTD.
6 TH FL NO, 148 SUNG KIANG ROAD,
TAIPEI, 10429, TAIWAN R.O.C.
PHONE : +886 (2) 5221304
FAX : +886 (2) 5630415

MALAYSIA

WO KEE HONG ELECTRONICS SDN. BHD.
NO. 102 JALAN SS 21/35, DAMANSARA
UTAMA, 47400 PETALING JAYA
SELANGOR DARUL EHSAN,
MALAYSIA
PHONE : +60 3 - 7184666
FAX : +60 3 - 7173828

JAPAN *Technical*

MARANTZ JAPAN, INC.
35- 1 , 7- CHOME, SAGAMIONO
SAGAMIHARA - SHI, KANAGAWA
JAPAN 228-8505
PHONE : +81 427 48 9379
FAX : +81 427 48 0889

日 本 マ ラ ン ツ 株 式 会 社

本 社 〒228-8505
神奈川県相模原市相模大野 7 - 35 - 1
営業本部 〒150-0022
東京都渋谷区恵比寿南 1 - 11 - 9

SINGAPORE

FORWARD MARKETING (S) PTE. LTD.
23, LORONG 8, TOA PAYOH,
SINGAPORE 319257.
PHONE : +65 2583640
FAX : +65 3564047

SHOCK, FIRE HAZARD SERVICE TEST :

CAUTION : After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard N0. 1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

1. TECHICAL SPECIFICATIONS

FM Stage (87.5 ~ 108.0 MHz)

Mono usable sensitivity ..... 11.3 dBf / 1.0 µV
Sensitivity of 50dB quieting
  Mono ..... 16.8 dBf / 1.9 µV
  Stereo ..... 39.2 dBf / 25 µV
Total harmonic distortion
  (Dev.=75kHz : U version)
  (Dev.=40kHz : /02, K, KK Version)
  Mono ..... 0.08 %
  Stereo ..... 0.12 %
Signal to noise ratio
  Mono ..... 80 dB
  Stereo ..... 74 dB
Selectivity adjacent channel 98MHz
  Wide IF ..... 40 dB
  Narrow IF ..... 60 dB
Stereo separation ..... 55 dB
Accuracy of frequency response
  across 30 Hz ~ 15 kHz band width ..... +0.5 / -1.0 dB
  Output level at 1 kHz deviation ..... 940 mV

AM Stage (520 ~ 1710 kHz)----- U Version

Sensitivity (s / n 20 dB 30 % Mod.) ..... 350 µV / m
Total harmonic distortion ..... 0.3 %
Signal to noise ratio ..... 52 dB

MW Stage (531 ~ 1602 kHz)----- /02, K, KK Version

Sensitivity (s / n 20 dB 30 % Mod.) ..... 350 µV / m
Total harmonic distortion ..... 0.3 %
Signal to noise ratio ..... 52 dB

LW Stage (152 ~ 280 kHz)----- /02 Version

Sensitivity (s / n 20 dB 30 % Mod.) ..... 1 m V / m
Signal to noise ratio ..... 50 dB

General

Power requirements supply
  U version ..... 120V AC, 60 Hz
  /02 version ..... 230V AC, 50 Hz
  K, KK version ..... 110/220V AC, 50/60 Hz
Power consumption ..... 8.5 W
Dimensions (MAX)
  Width ..... 458 mm
  Height ..... 86 mm
  Depth ..... 315 mm
Weight ..... 6.8 kg

Design and specifications are subject to change without notice.

[FM部]

受信周波数範囲 ..... 76 MHz~ 90 MHz
実用感度 （75Ω モノラル） 11.3dBf/1.0µV
S/N 50 dB感度 （モノラル） 16.8dBf/1.9µV
（ステレオ） 39.2dBf/25µV
高調波歪率 （モノラル） ..... 0.08 %
（ステレオ） ..... 0.12 %
S/N比 （モノラル） ..... 80 dB
（ステレオ） ..... 73 dB
実効選択度 WIDE ..... 40 dB
NARROW ..... 63 dB
ステレオセパレーション 1kHz ..... 55 dB
周波数特性30 Hz~15 kHz ..... +0.5, -1.0 dB
イメージ妨害比 ..... 75 dB
IF 妨害比 ..... 100 dB
スプリアス妨害比 ..... 100 dB
AM抑圧比 ..... 70 dB
サブキャリア抑圧比 ..... 70 dB
出力レベル ..... 940 mV

[AM部]

受信周波数範囲 ..... 531 kHz~ 1602 kHz
実用感度 （LOOP） 350µV/m
高調波歪率 1 kHz （モノラル） ..... 0.3 %
S/N比 （モノラル） ..... 52 dB
ステレオセパレーション 1kHz ..... 30 dB
出力レベル/インピーダンス（ 30 %変調 ） ..... 280 mV/1.7 kΩ

[その他]

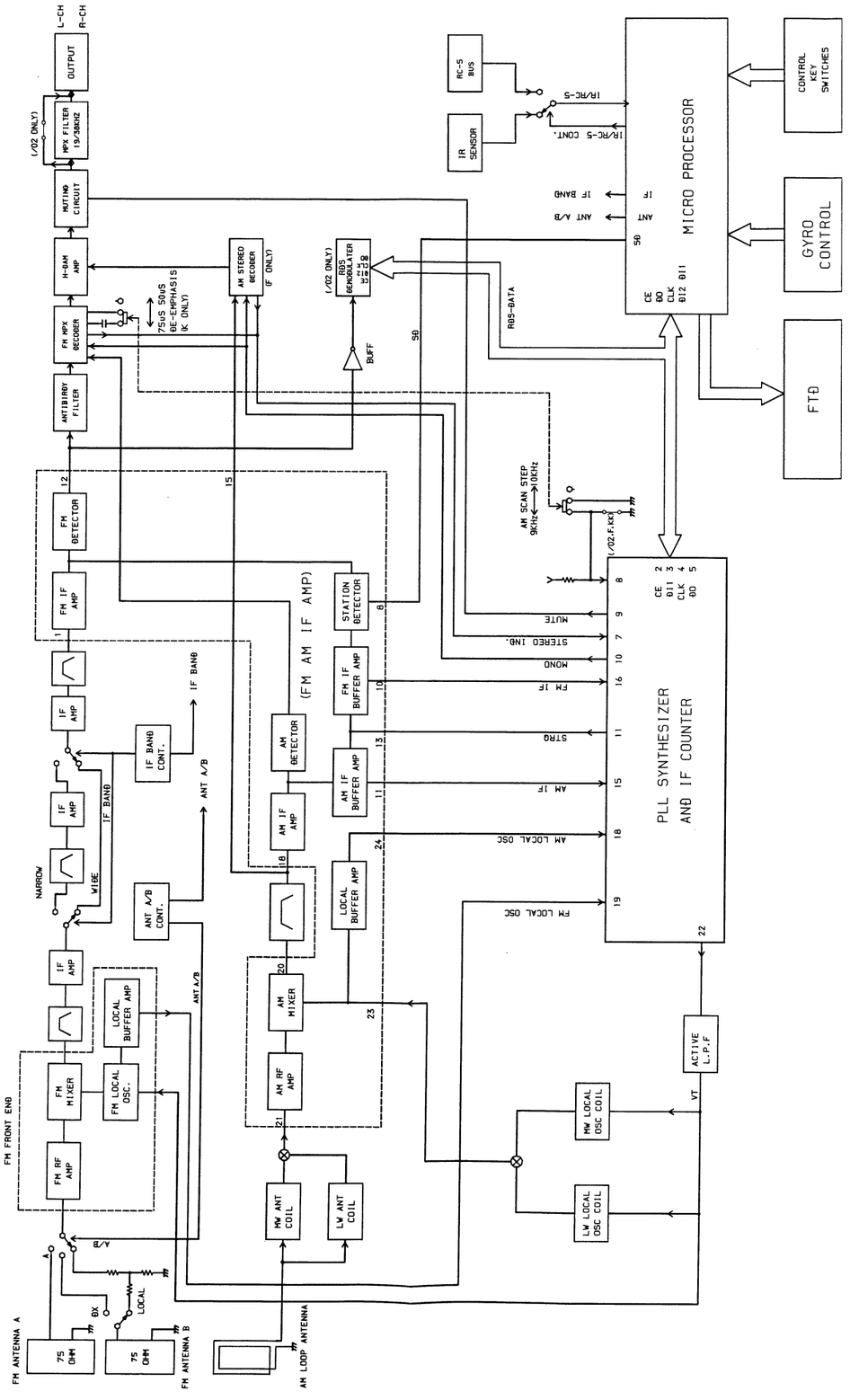
電源電圧 ..... AC 100V, 50 Hz/60 Hz
消費電圧（電気用品取締法） 9W
最大外形寸法（幅 x 高さ x 奥行き） ..... 458 x 86 x 315 mm
質量 ..... 6.8 kg

[付属品]

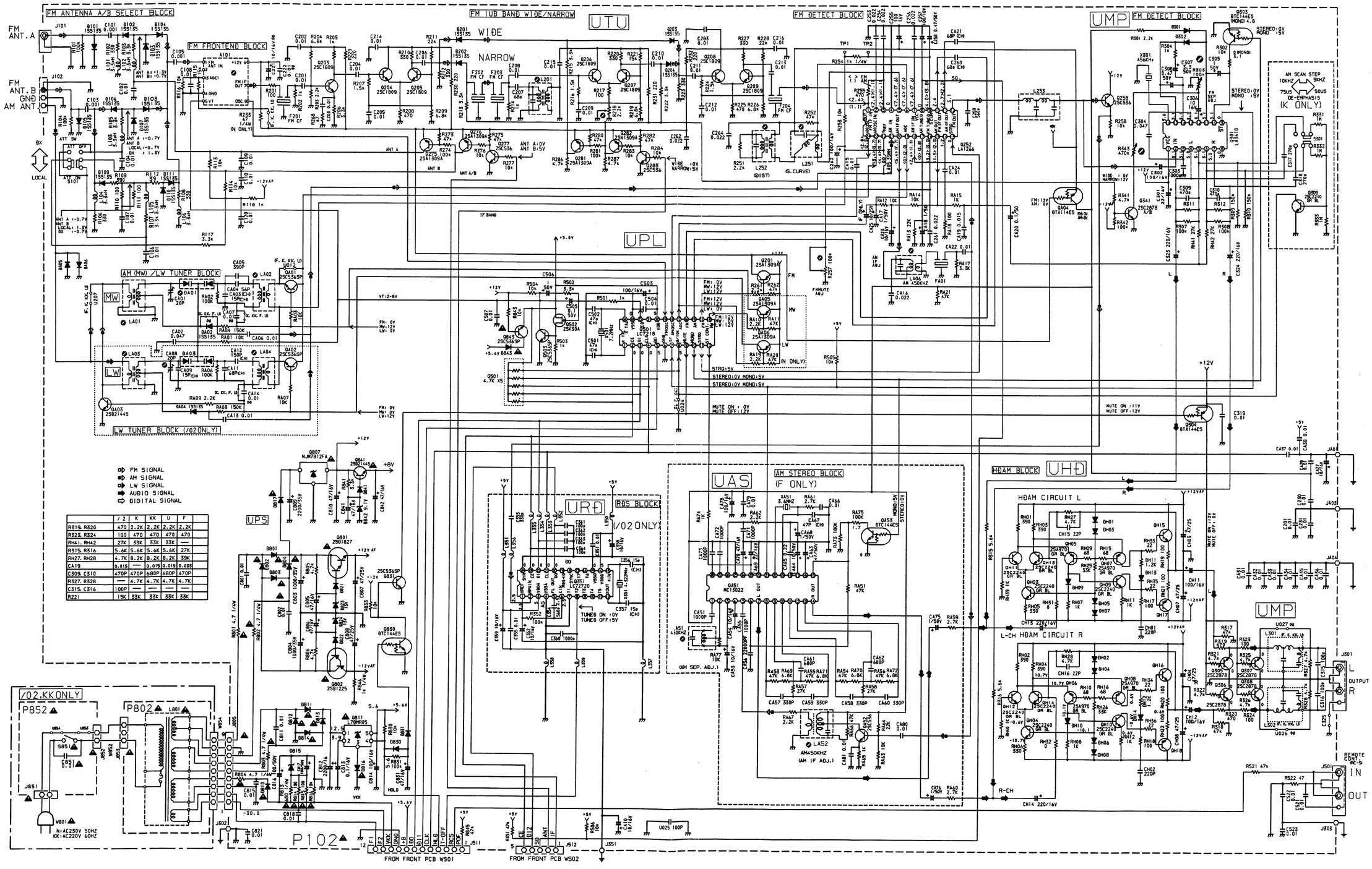
カードリモコン(RC-17ST,ボタン電池CR2025x1,同梱) x1
FM T型アンテナ x1
AMループアンテナ(一式) x1
オーディオコード x1
アンテナアダプター x1
リモコンコード x1

本機の規格および外観は改良のため予告なく変更することがありますが、ご了承ください。

2. BLOCK DIAGRAM



3. SCHEMATIC DIAGRAM AND PARTS LOCATION (Pattern side)



	/2	K	KK	U	F	
R519, R520	470	2.2K	2.2K	2.2K	2.2K	
R523, R524	100	470	470	470	470	
RH41, RH42	27K	33K	33K	33K	—	
R515, R516	5.6K	5.6K	5.6K	5.6K	27K	
RH27, RH28	4.7K	8.2K	8.2K	8.2K	39K	
CA19	0.015	—	0.015	0.015	0.033	
C309, C310	470P	470P	680P	680P	470P	
R527, R528	—	4.7K	4.7K	4.7K	4.7K	
C315, C316	100P	—	—	—	—	
R221	15K	33K	33K	33K	33K	

MARK	VERSIONS
N	/02
U	USA
F	JAPAN
K	FAR EAST
KK	KOREA

Q843 QA53 Q303 Q341 Q301 QA51 Q258 Q452 Q252 Q351

Q830 QH013 QH11 Q282 Q281 Q206 Q207 Q208 Q209 QA01

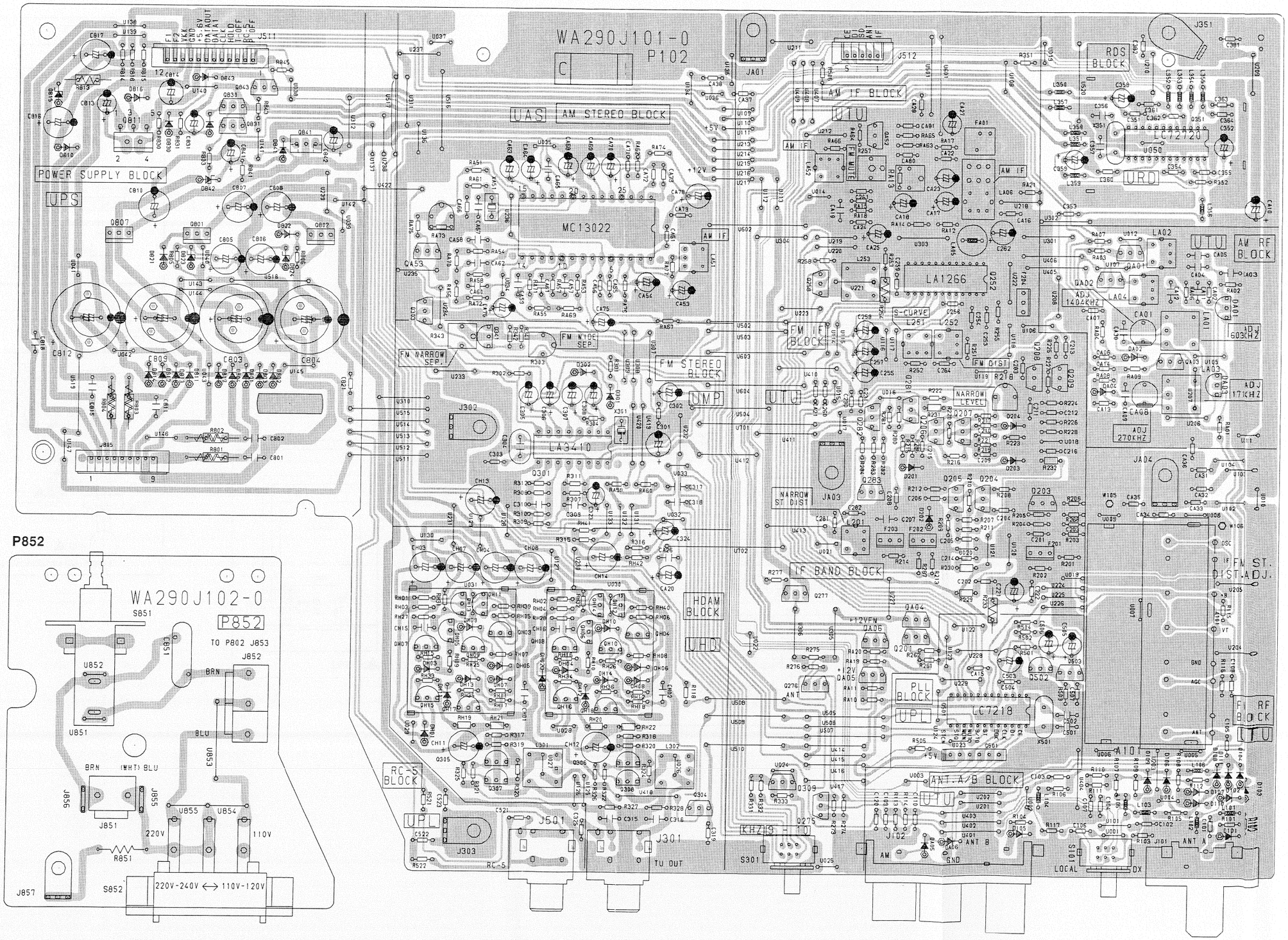
Q811 Q831 Q841 QH07 QH05 QH09 QH03 QH14 QH12 Q283 QA06 QA04 Q205 Q204 Q203 QA02

Q807 Q801 Q802 QH15 QH17 QH08 QH06 QH10 QH04 Q277 Q276 QA05 Q201 Q502 Q503 QA03

QH16 QH18

Q305 Q307 Q306 Q308 Q304 Q309 Q275 Q501

P102



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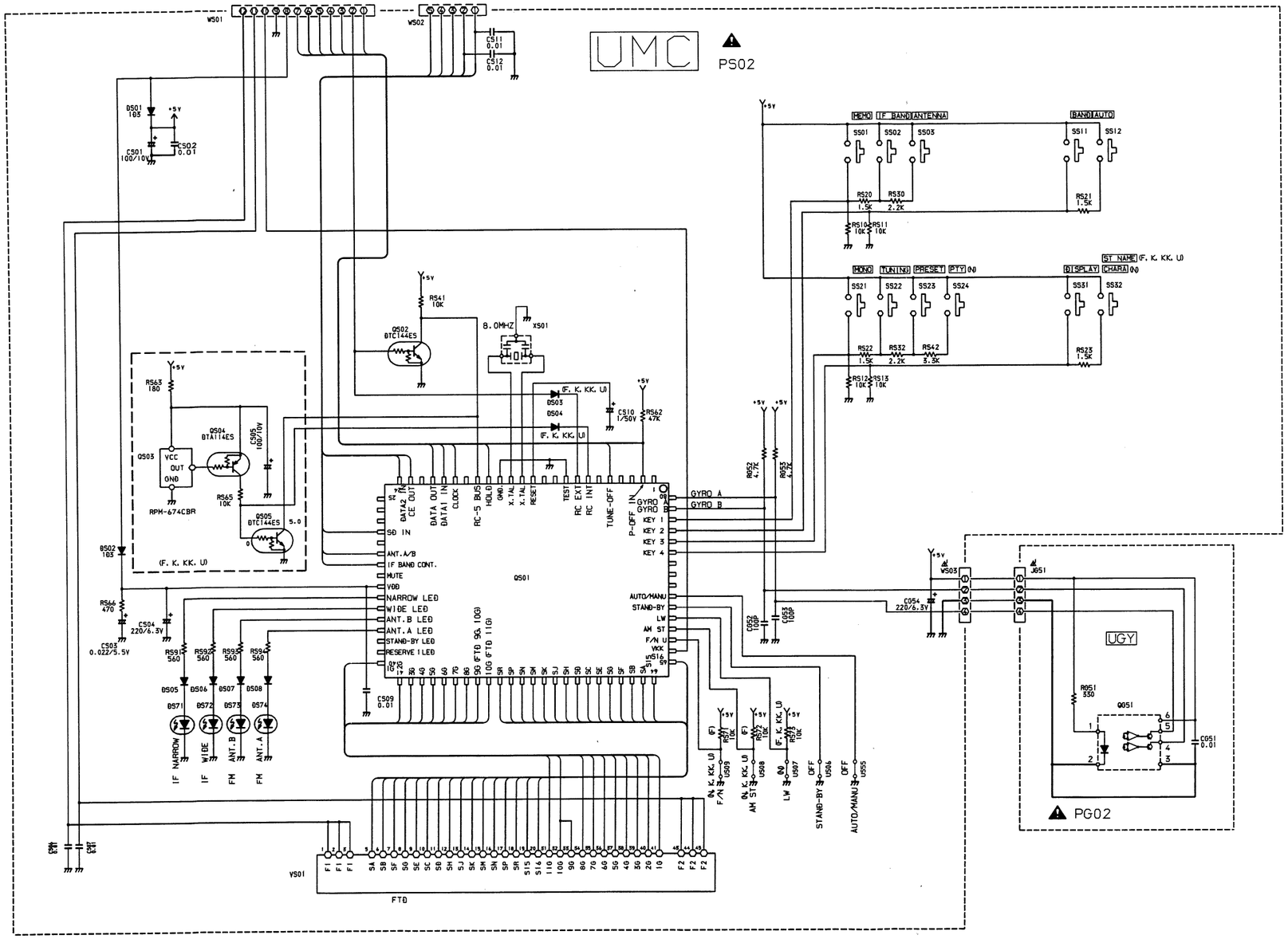
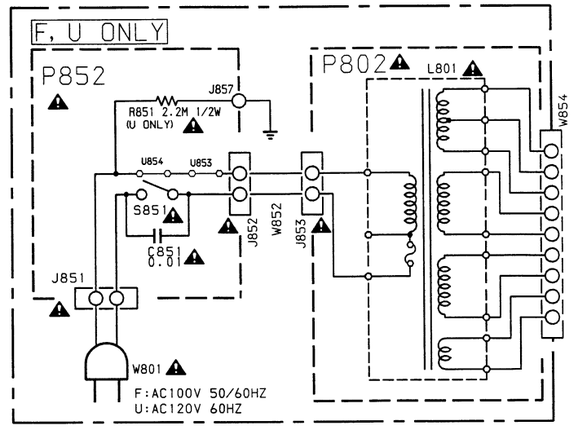
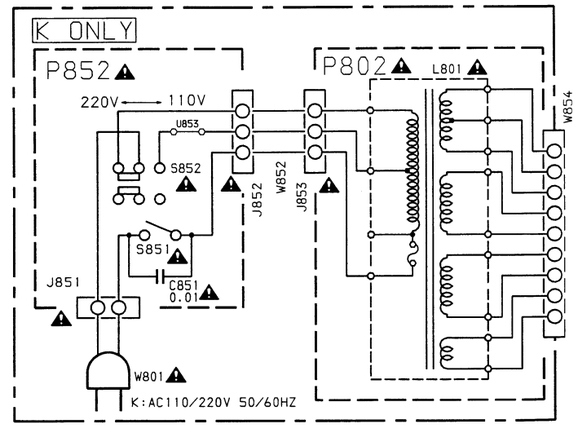
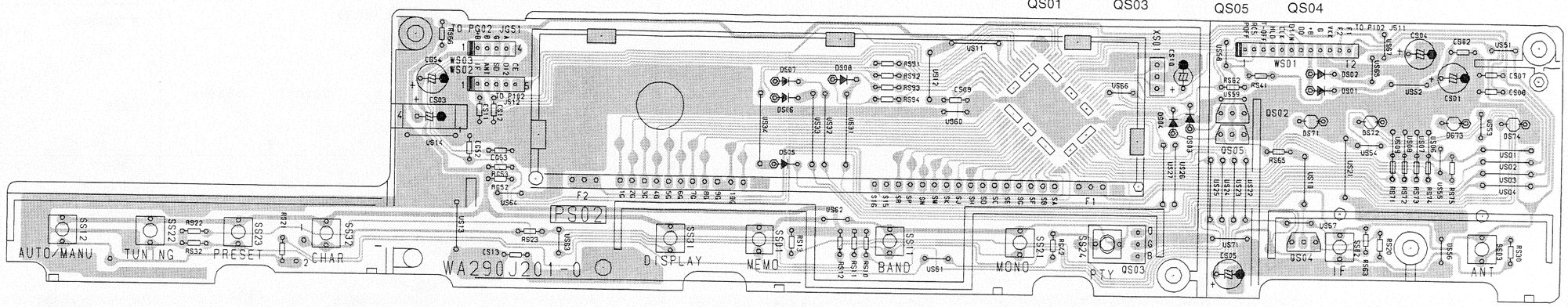


MARK	VERSIONS
N	/02
U	USA
F	JAPAN
K	FAR EAST
KK	KOREA

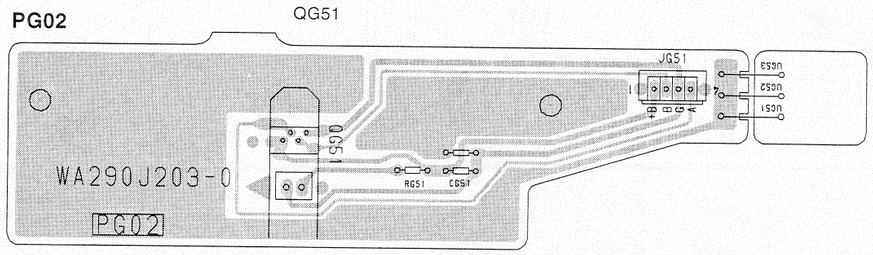




PS02



PG02



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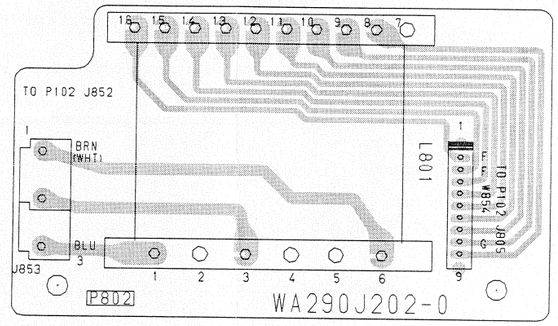
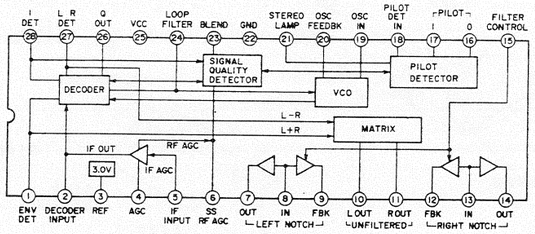
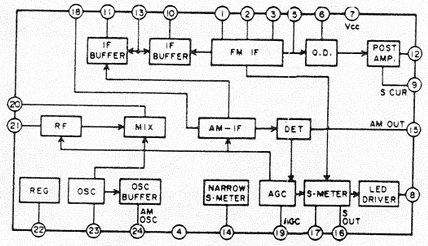


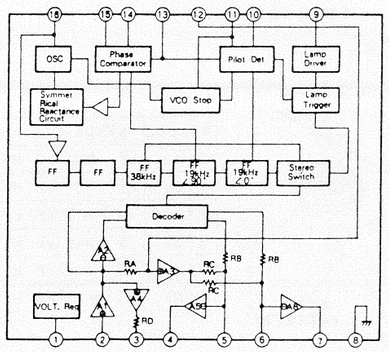
QA51 : MC13022



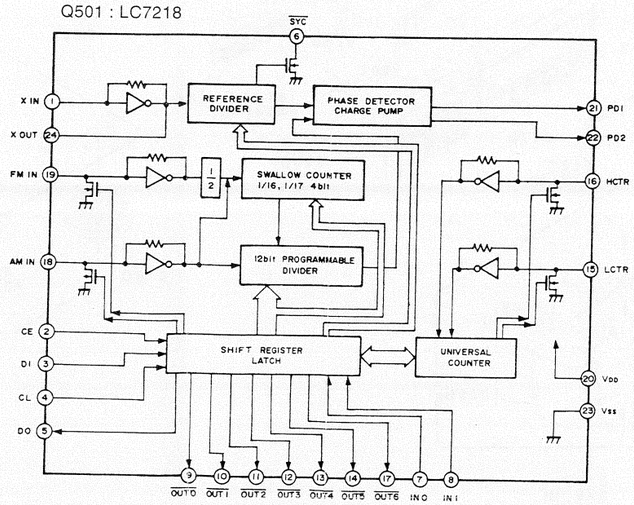
Q252 : LA1266



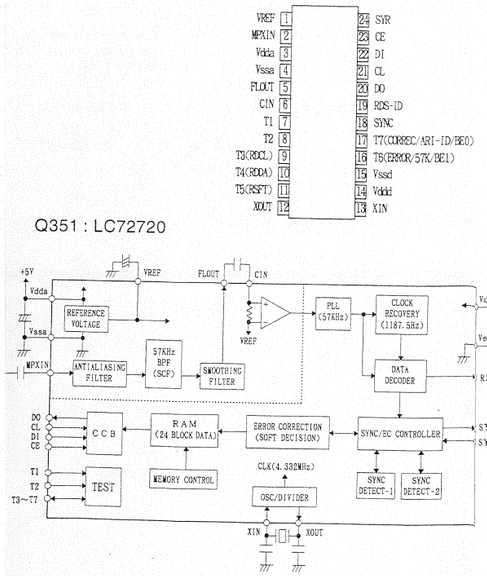
Q301 : LA3410



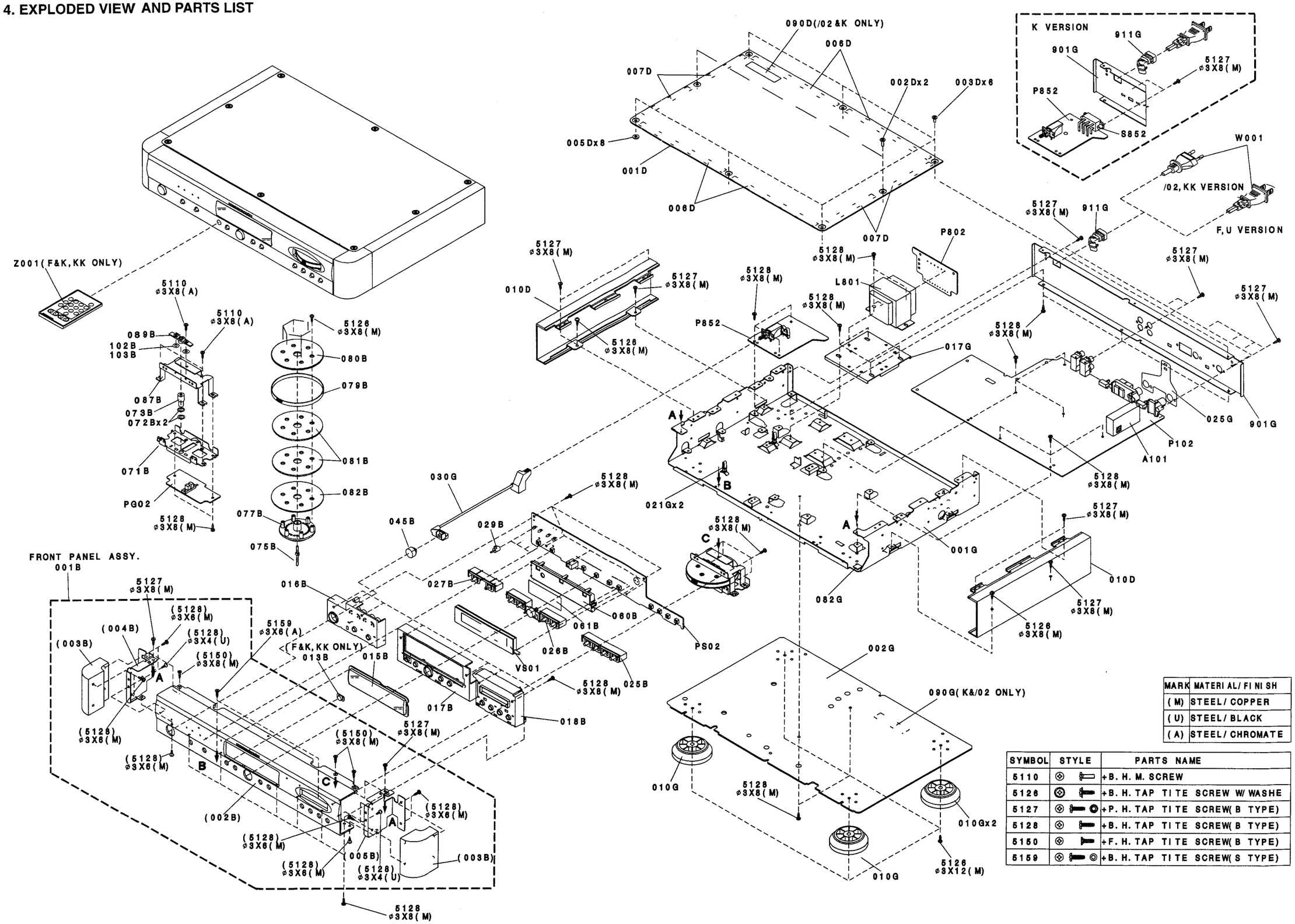
Q501 : LC7218



Q351 : LC72720



4. EXPLODED VIEW AND PARTS LIST



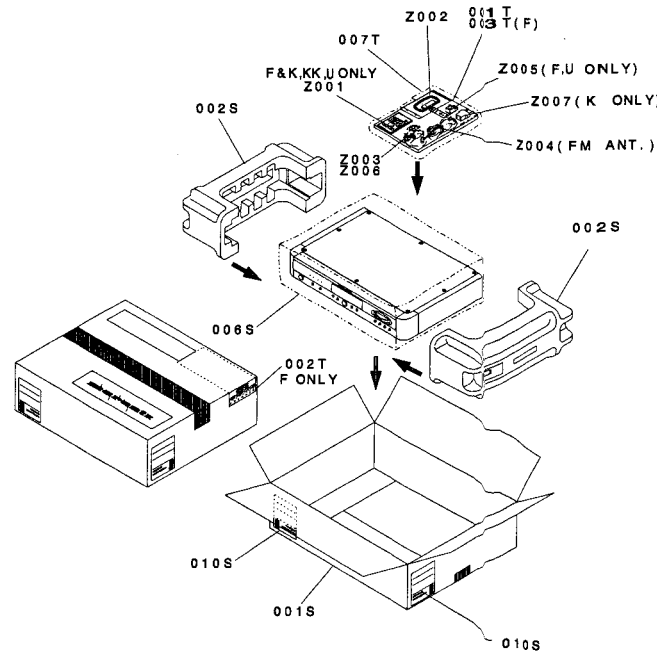
MARK	MATERIAL/FINISH
(M)	STEEL/COPPER
(U)	STEEL/BLACK
(A)	STEEL/CHROMATE

SYMBOL	STYLE	PARTS NAME
5110		+B.H.M.SCREW
5126		+B.H.TAPTITE SCREW W/WASHE
5127		+P.H.TAPTITE SCREW(B TYPE)
5128		+B.H.TAPTITE SCREW(B TYPE)
5150		+F.H.TAPTITE SCREW(B TYPE)
5159		+B.H.TAPTITE SCREW(S TYPE)

(VERS. :VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
001B	FN,KGL KKGL		FRONT PANEL,ASSY GL	290J248530
001B	KBL UBL		FRONT PANEL,ASSY BL	290J248520
001B	/02B		FRONT PANEL,ASSY BL	290J248500
001B	/02G		FRONT PANEL, ASSY GL	290J248510
002B	FN,KGL KKGL		FRONT PANEL,AL GL	290J248310
002B	KBL UBL		FRONT PANEL,AL BL	290J248210
002B	/02B	4822 459 04894	FRONT PANEL,AL BL	290J248010
002B	/02G	4822 459 04895	FRONT PANEL,AL GL	290J248110
003B	GOLD	4822 444 40853	ESCUTCHEON,CORNER AL	318K063110
003B	BLACK	4822 444 40852	ESCUTCHEON,CORNER AL	318K063010
013B	FN,KGL KKGL		IR LENS FOR GL	290J355110
013B	KBL, UBL		IR LENS 3L	290J355010
015B	GOLD	4822 450 10143	WINDOW,PINK	318K158110
015B	BLACK	4822 450 10141	WINDOW,BLUE	318K158010
016B	GOLD		RETAINER,HOLDER L-SIDE	290J104110
016B	BLACK		RETAINER,HOLDER L-SIDE	290J104010
017B	GOLD		RETAINER,HOLDER FL-SIDE	290J104320
017B	BLACK		RETAINER,HOLDER FL-SIDE	290J104220
018B	GOLD		RETAINER,JYRO HOLDER GL	290J104130
018B	BLACK		RETAINER,JYRO HOLDER BL	290J104030
025B	GOLD	4822 410 11672	BUTTON FOR JYRO	290J270130
025B	BLACK		BUTTON FOR JYRO	290J270030
026B	GOLD		BUTTON FOR FL	290J270320
026B	BLACK		BUTTON FOR FL	290J270220
027B	GOLD	4822 410 70034	BUTTON FOR ANTENNA IF	318K270140
027B	BLACK	4822 410 70029	BUTTON FOR ANTENNA IF	318K270040
029B		4822 381 11939	LENS	252J355010
045B	GOLD	4822 410 70031	BUTTON POWER GL	318K270110
045B	BLACK	4822 410 70026	BUTTON POWER BL	318K270010
060B		4822 255 41068	FL HOLDER	066J271010
061B		4822 459 10942	STICKER,FL ADHESIVE	056J122020
072B			WASHER,SPACER FOR GYRO SHAFT 073B	59071102G0
073B			SHAFT,JYRO SUSTAINER DOWN-SIDE	290J112020
075B			SHAFT,JYRO MAIN	290J112010
077B			JYRO FLY WHEEL BASE	290J273010
079B	GOLD		JYRO ESC. RUBBER RING GL	290J066110
079B	BLACK		JYRO ESC. RUBBER RING BL	290J066010
080B	GOLD	4822 410 11676	JYRO ESC. DOWN & UP:GL	290J063110
080B	BLACK	4822 410 11675	JYRO ESC. DOWN & UP:BL	290J063010
082B	GOLD		JYRO ESC. DOWN & UP:GL	290J063110
082B	BLACK		JYRO ESC. DOWN & UP:BL	290J063010
089B			RETAINER,JYRO SUSTAINER UP-SIDE	290J104050
001D	GOLD	4822 444 30517	LID,TOP COVER AL GL	318K257110
001D	BLACK	4822 444 30516	LID,TOP COVER AL BL	318K257010
002D	GOLD	4822 502 14425	SCREW,THINHEAD 3x8	323S010020
002D	BLACK	4822 502 21693	SCREW,THINHEAD 3x8	323S010030
003D	GOLD	4822 502 14462	SCREW,.THINHEAD 3x5	318K010020
003D	BLACK	4822 502 14461	SCREW,THINHEAD 3x5	318K010030
005D			TOP COVER SPACER	318K118010
010D	GOLD	4822 444 40855	SIDE PANEL GL	318K249110
010D	BLACK	4822 444 40854	SIDE PANEL BL	318K249010

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
010G	GOLD	4822 462 42134	LEG,D60 H18,AL. GOLD SAND	291K057010
010G	BLACK	4822 462 42134	LEG,D60 H18,AL. GOLD SAND	291K057010
030G		4822 402 10913	LINK,POWER SW.	318K121010
⚠ W001	F		MAINS CORD, F	YC01900180
⚠ W001	K		MAINS CORD, AC250V 10A	YC01800880
⚠ W001	KK		MAINS CORD, AC250V 7A	YC02000780
⚠ W001	/02	4822 321 10985	MAINS CORD, /02	YC01800610
⚠ W001	U		MAINS CORD, UL CSA	YC01800780
			PACKING	
001S	F		PACKING CASE GL	290J801020
001S	U		PACKING CASE BL	290J801010
002S	F,U		CUSHION L R	318K809010
001T	F		USER GUIDE	290J851110
001T	K		USER GUIDE	290J851350
001T	KK		USER GUIDE	290J851360
001T	/02	4822 736 15915	USER GUIDE	290J851310
001T	U		USER GUIDE ST-17 ENG.	290J851250
Z001	F,K		UNIT KIT,RC-17ST	ZK290J0010
	KK,U		REMOTE CONTROL	
Z002			ANT COIL,AM LOOP	LA00055010
Z003			CONNECTIVE CORD,RCA ST.CORD 1M GOLD	ZD01000550
Z004	F,U		EXT.ANTENNA,EXT FM ANT	ZA02000070
Z004	K,KK, /02		EXT.ANTENNA,EXT FM ANT 931222R MAYOR	ZA02800020
Z005	F,U		PLUG,ANT ADAPTOR	YP90000310
Z006			CONNECTIVE CORD,RCA RC-5 CORD 0.9M ORANGE	ZD00900100
⚠ Z007	K		JACK, AC ADAPTER SMK S-I6116	YJ04001240



5. SERVICE PROGRAM

5-1. Tracking point memory mode

While holding the "**MEMO**" + "**BAND**" Buttons together (Press and hold the **MEMO** Button first), press the "**MONO**" Button to recall tracking point frequencies as shown below. (User programmed frequencies will be deleted.)

Tracking point frequencies

Version	P1~P3	P4	P5	P6	
F	76.0	78.0	83.0	88.0	MHz
U,K,KK,/02	87.5	90.0	98.0	106.0	

Version	P7	P8	P9	P10	P11	P12	P13	
F	603	999	1404	531	531	531	531	kHz
U	600	1000	1400	520	520	520	520	
K,KK,/02 LW Not used	603	999	1404	531	531	531	531	
K,KK,/02 LW Used	603	999	1404	171	207	270	152	

All of P14 to P60 are cleared.

Table-1 表1

[REMARK]

How to clear preset memories;

While holding the "**MEMO**" + "**BAND**" Buttons together (Press hold the **MEMO** Button first), press the "**TUNING**" Button.

The FL display shows "**CLEAR**" and preset memories are cleared.

5-2. Segment check mode

1) While holding the "**MEMO**" + "**BAND**" Buttons together (Press and hold the **MEMO** Button first), press the "**DISPLAY**" Button.
   The FL display shows "**FL CHECK**", two seconds. After that all segments turn off, then the segments light one by one in sequence the "**Sa**" segment to "**S16**" segment at a rate of 0.3 second per segment. Finally all segments are turned on 3 seconds and the segment check mode finish. (The band and frequency will be returned previous status which had selected before segment check mode.)

2) When all the segments are lit, they remain lit for 3 seconds and the segment check mode completes. (The band and frequency selected immediately before the segment check mode are recalled.)

3) If the "**MEMO**" Button is pressed while all the segments are turned on, it will be returned previous status and then remain it be lit continuously. If the other operation Button is pressed (Which has related display indication ; ex. TUNING), the FL display shows normal indication occurs only for 5 seconds, after that all the segments light up again.

[REMARK]

The segment check mode can be released by turning the mains power off.

5-3. Local oscillator oscillation check

1) While holding the "**MEMO**" + "**BAND**" Buttons together (Press and hold the **MEMO** Button first), press the "**CHAR**" or "**ST NAME**" Button.
2) The FL display shows "**SERVICE**" for 2 seconds, after that some of the messages listed in the table will be shown. The displayed message makes it possible to check the oscillation of the local oscillators for the FM/AM (MW, LW) bands and the status of the data bus line between the microprocessor and PLL IC.

Displayed Message	Description
TUNER OK	All of the data bus and the FM and AM (MW, LW) local oscillators are OK.
TUNER NG	The data bus is OK, but the FM and AM (MW, LW) local oscillators are NG.
FM MW NG	The data bus and the LW local oscillator are OK, but the FM and MW local oscillators are NG. (When the LW is used)
FM LW NG	The data bus and the MW local oscillator are OK, but the FM and LW local oscillators are NG. (When the LW is used)
MW LW NG	The data bus and the FM local oscillator are OK, but the MW and LW local oscillators are NG. (When the LW is used)
FM NG	The data bus and the AM (MW, LW) local oscillator are OK, but the FM local oscillator is NG.
AM NG	The data bus and FM local oscillator are OK, but the AM local oscillator is NG. (When the LW is not used)
MW NG	The data bus and the FM and LW local oscillators are OK, but the MW local oscillator is NG. (When the LW is used)
LW NG	The data bus and the FM and MW local oscillators are OK, but the LW local oscillator is NG. (When the LW is used)
PLL NG	The data bus line or the PLL IC operation is NG.

Table-2 表2

[REMARK]

The "**TUNER OK**" message is shown for 2 seconds, after that the service mode will be finish automatically.

Other message listed in the table (Error messages) blinks until any Button is pressed, and the service mode will be finish when a Button is pressed. (Even when the defect is repaired while the message is blinking, present error message will not change to the "TUNER OK" message.)

サービスプログラム

1．トラッキングポイントメモリーモード

「MEMO」＋「BAND」ボタンを同時に押しながら（但し「MEMO」ボタンを先に押す）「MONO」ボタンを押すとTracking point 周波数が表1の様にメモリーされます。（前データーがある場合はオーバーライトされる）

［注意］プリセットメモリーのクリヤーの方法

「MEMO」＋「BAND」ボタンを同時に押しながら（但し「MEMO」ボタンを先に押す）「TUNING」ボタンを押します。FLに"CLEAR"と表示されプリセットメモリーがクリヤーされます。

2．セグメントチェックモード

1）「MEMO」＋「BAND」ボタンを同時に押しながら（但し「MEMO」ボタンを先に押す）「DISPLAY」ボタンを押します。"FL CHECK"とFLに2秒間点灯表示した後、一旦、全消灯し全桁同時に「Sa」セグメントから順番に「S16」セグメントまで、0.3秒/セグメントのスピードで順次点灯します。

2）全セグメントが点灯するとそのまま3秒間点灯した後、セグメントチェックモードを完了します。
（BAND及び周波数は、セグメントチェックモードの直前に戻ります。）

3）3秒間点灯中に「MEMO」ボタンを押すと一旦通常表示状態になり、その後全セグメントが点灯したままの状態をそのまま継続します。
その後、表示内容を変更するようなボタン操作（例えば選局）を行なうと5秒間だけ通常の表示をした後、全セグメント点灯に戻ります。
電源をOFFすると解除します。

3．ローカルオシレーター回路の発振チェック

1）「MEMO」ボタンと「BAND」ボタンを同時に押しながら（但し［MEMO］ボタンを先に押す）「ST NAME」ボタンを押します。

2）"SERVICE"と2秒間表示した後、表2のうちいずれかが表示されFM/AM(MW,LW)各バンドのローカルオシレータの発振状態、マイコンとPLLIC間のデータバスラインの状態が確認できます。

"TUNER OK"は2秒間表示され自動的にサービスモードを終了します。
それ以外の"NG"表示はボタン（どれでも可）を押すまで点滅し、ボタンを押すとサービスモードを終了します。（点滅中に不良個所を直しても"TUNER OK"表示にはなりません）

6. TUNER ALIGNMENT PROCEDURES

- Set to Tracking point memory mode of the service program. (P4) to (P12) in the Digital Readout Frequency Setting column shows preset numbers for the above mode.
- Before alignment, connect a dummy resistor of 47 kohms to the output terminal.

TEST EQUIPMENT REQUIRED

1) AM/FM Signal Generator
2) Video Signal Generator
3) Digital Multimeter
4) Distortion level meter

6-1. FM Alignment Procedures

FM RF Alignment

(Band switch at "FM" position and MONO switch at "ON" position)
(Antenna selector switch at "A" position and IF BAND selector switch at "WIDE" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μV output to FM antenna terminal (75-ohm).	98.0 MHz (83MHz)	DC VTVM to testpoint TP1 and TP2 (R254)	98.0 MHz (P5) 83 MHz [F] (P5)	With L251 set the tuning voltage to 0V.
2			Distortion meter to L- or R-channel output		L252 core for minimum distortion.

FM IF Alignment

(Band switch at "FM" position and MONO switch at "OFF" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 µV output modulated by MPX signal generator to FM antenna terminal (75-ohm). Modulation level: 67.5 kHz (L + R) [F,U] 6.75 kHz (PILOT) 40 kHz (L + R) [/02,K,KK] 6 kHz (PILOT)	Stereo L-channel (1.000 Hz)	VTVM to L-channel output (J301 L-channel)	98.0 MHz (P5) 83.0 MHz [F] (P5)	Front end IFT for minimum distortion.
2		Stereo R-channel (1.000 Hz)	VTVM to R-channel output (J301 R-channel)		

Muting Level Alignment (WIDE)

(Band switch at "FM" position and MONO switch at "OFF" position IF BAND switch at "NARROW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 8.9 µV output to FM antenna terminal (75-ohm)	98.0 MHz 83.0 MHz [F]	AC VTVM to L- or R-channel output (J301)	98.0 MHz (P5) 83.0 MHz [F] (P5)	R257 to a point at which output appears.

Muting Level Alignment (NARROW)

(Band switch at "FM" position and MONO switch at "OFF" position IF BAND switch at "NARROW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 8.9 µV output to FM antenna terminal (75-ohm)	98.0 MHz 83.0 MHz [F]	AC VTVM to L- or R-channel output (J301)	98.0 MHz (P5) 83.0 MHz [F] (P5)	R218 to a point at which output appears.

Multiplex Alignment (WIDE)

(Band switch at "FM" position and MONO switch at "OFF" position IF BAND switch at "WIDE" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 µV output modulated by MPX signal generator to FM antenna terminal (75-ohm) Modulation level : 67.5 kHz (L + R) [F,U] 6.75 kHz (PILOT) 40 kHz (L + R) [/02,K,KK] 6 kHz (PILOT)	Stereo L-channel (1.000 Hz)	VTVM to R-channel output (J301 R-channel)	98.0 MHz (P5) 83.0 MHz [F] (P5)	R303 so that channel separation is identical between both channels.
2		Stereo R-channel (1.000 Hz)	VTVM to L-channel output (J301 L-channel)		

Multiplex Alignment (NARROW)

(Band switch at "FM" position and MONO switch at "OFF" position IF BAND switch at "NARROW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μV output modulated by MPX signal generator to FM antenna terminal (75-ohm) Modulation level : 67.5 kHz (L + R) [F,U] 6.75 kHz (PILOT) 40 kHz (L + R) [/02,K,KK] 6 kHz (PILOT)	Stereo L-channel (1.000 Hz)	VTVM to R-channel output (J301 R-channel)	98.0 MHz (P5) 83.0 MHz [F] (P5)	R343 so that channel separation is identical between both channels.
2		Stereo R-channel (1.000 Hz)	VTVM to L-channel output (J301 L-channel)		

6-2. AM (MW) Alignment Procedures

(Band switch at "AM" position)

AM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	Sweep generator to AM antenna terminal.	450 kHz	AC VTVM to L- or Rchannel output (J301)	——	LA06 LA52 for maximum and symmetrical waveform. LA52 [F] only

AM (MW) RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	AM signal generator to AM loop antenna in a test loop.	603 kHz	AC VTVM to L- or R-channel output (J301)	603 kHz (P7)	LA01 for maximum output.
2		1404 kHz		1404 kHz (P9)	CA01 for maximum output.

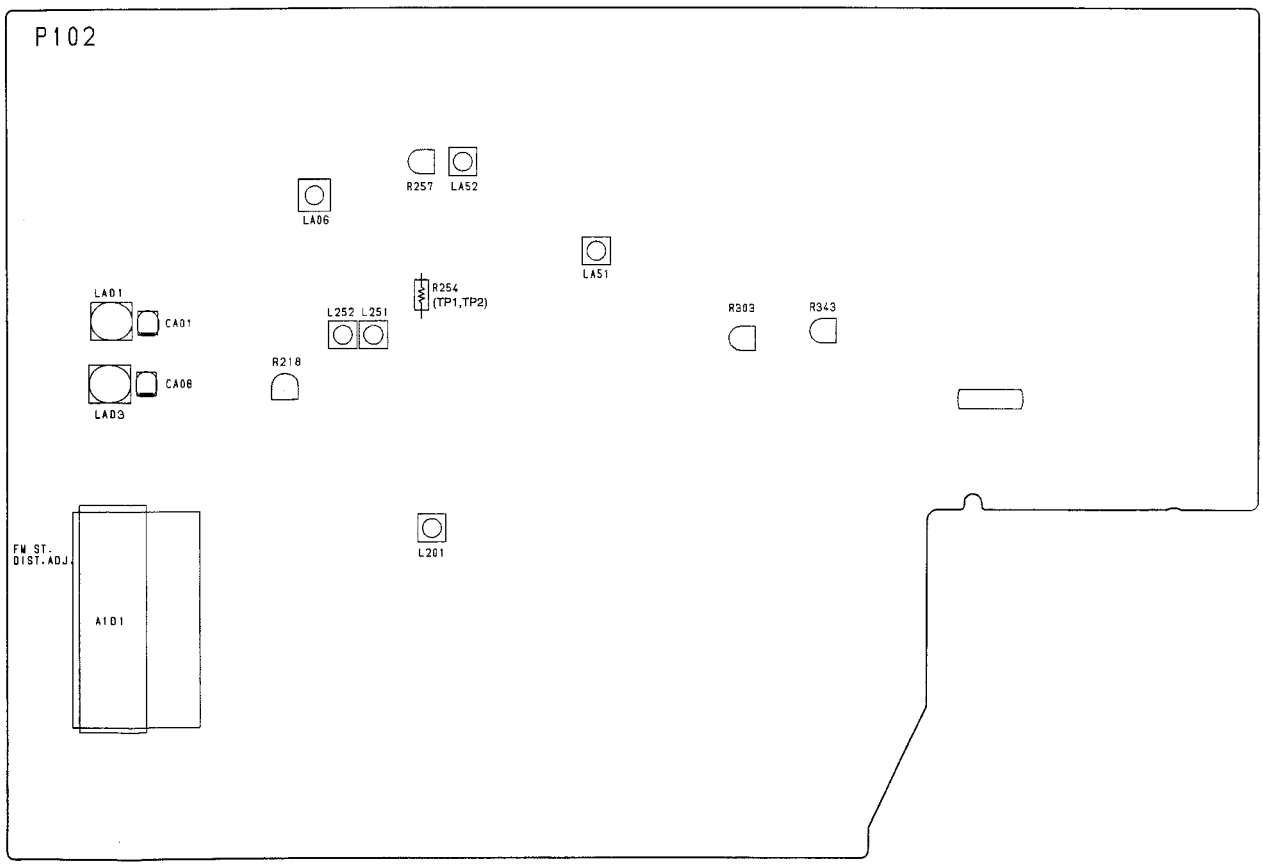
LW RF Alignment [/02] ONLY

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	AM signal generator to AM loop antenna in a test loop.	171 kHz	AC VTVM to L- or R-channel output (J301)	171 kHz (P10)	LA03 for maximum output.
2		270 kHz		270 kHz (P12)	CA08 for maximum output.

AM Stereo 調整 [F仕向] ONLY

手順	信号発振器の接続	発信周波数	測定器の接続	発信周波数	調整箇所
1	テストループを使いAM信号発振器からAMループアンテナに信号を加えます。 (50mV/m) 変調レベル： 400 Hz (L - R) = 80% 25 Hz PILOT = OFF	999kHz	左又は右チャンネル出力に交流VTVMを接続します。 (J301)	999kHz (P8)	セットのL-CH(又はR-CH)の出力が最小になるようにLA06,LA52,LA51を調整します。

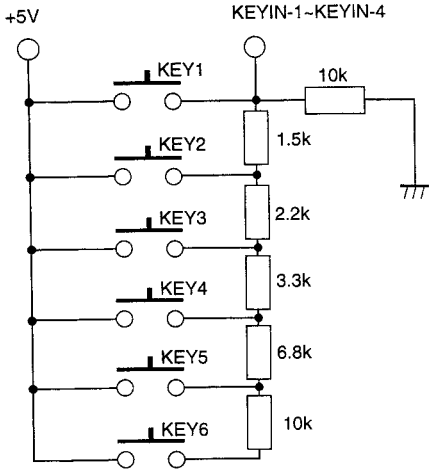
7. ALIGNMENT AND TEST POINT



8. MICROPROCESSOR SPECIFICATIONS

		Receiving Frequency 受信周波数	Channel Space チャンネルスペース	Reference Frequency 基準周波数	Intermediate Frequency 中間周波数
F	FM	76.0 ~ 90.0MHz	100kHz	25kHz	-10MHz
	AM	531 ~ 1602kHz	9kHz	9kHz	+450kHz
U	FM	87.50 ~ 108.00MHz	50kHz	25kHz	+10.7MHz
	AM	520 ~ 1710kHz	10kHz	10kHz	+450kHz
/02 K,KK	FM	87.50 ~ 108.00MHz	50kHz	25kHz	+10.7kHz
	MW	531 ~ 1602kHz	9kHz	9kHz	+450kHz
	LW	152 ~ 280kHz	1kHz	1kHz	+450kHz

Key Matrix



KEY NO.	KEY IN VOLTAGE	CONPALATOR VOLTAGE	
		LOWER	UPPER
1	5.00V	4.77V Over	
2	4.35V	4.06V	4.69V
3	3.65V	3.44V	3.98V
4	2.94V	2.58V	3.36V
5	2.10V	1.80V	2.50V
6	1.48V	1.25V	1.72V

QS01 : TMP87CM71F

Pin no.	Port	Function	In/Out	Active	Specification	Pin no.	Port	Function	In/Out	Active	Specification
1	P10	INT0				41	P67	G8	OUT	H	2G
2	P11	INT1	IN	L	POWER OFF IN	42	P70	G7	OUT	H	3G
3	P12	INT2/TC1				43	P71	G6	OUT	H	4G
4	P13	DV0				44	P72	G5	OUT	H	5G
5	P14		OUT	L	TUNED	45	P73	G4	OUT	H	6G
6	P15	TC2				46	P74	G3	OUT	H	7G
7	P16		OUT	H	RC INT	47	P75	G2	OUT	H	8G
8	P17		OUT	H	RC EXT	48	P76	G1	OUT	H	9G
9	TEST	TEST				49	P77	G0	OUT	H	10G
10	P21	XT IN				50	P80	S0	OUT	H	Sr
11	P22	XT OUT				51	P81	A1	OUT	H	Sp
12	RESET		IN	L	RESET	52	P82	S2	OUT	H	An
13	X IN	X IN			XTAL (8.0MHz)	53	P83	A3	OUT	H	Am
14	X OUT	X OUT			XTAL	54	P84	S4	OUT	H	Sk
15	VSS	VSS			VSS	55	P85	S5	OUT	H	Sj
16	P20	INT5/STOP	IN	L	HOLD POWER DOWN	56	P86	S6	OUT	H	Sh
17	P30	INT3/TC3	IN		RC-5 BUS	57	P87	OUT	OUT	H	Sd
18	P31	TC4				58	P90	S8	OUT	H	Sc
19	P32	SCK	OUT		CLOCK	59	P91	S9	OUT	H	Se
20	P33	SI	IN		DATA1 IN (FROM DO LC7218)	60	P92	S10	OUT	H	Sg
21	P34	SO	OUT		DATA OUT (TO LC7218/LC72720)	61	P93	S11	OUT	H	Sf
22	P35	HSCK				62	P94	S12	OUT	H	Sb
23	P36		OUT	H	CE OUT (TO LC7218/LC72720)	63	P95	S13	OUT	H	Sa
24	P37	HSO	IN		DATA2 IN (FROM LC72720)	64	P96	S14	OUT	H	S15
25	P00					65	P97	S15	OUT	H	S16
26	P01					66	VKK	VKK			
27	P02					67	P40	KEY0	IN	H	JAPAN
28	P03		IN		LSD IN	68	P41	KEY1	IN	H	AM STEREO
29	P04					69	P42	KEY2	IN	L	LW
30	P05		OUT		ANT A/B (ANT)	70	P43	KEY3	IN	H	STANDBY
31	P06		OUT		IF BAND OUT (WIDE)	71	P44	KEY4	IN	L	AUTO/MANU
32	P07		OUT	L	MUTE	72	P45	KEY5			
33	VDD	VDD			VDD	73	P46	CIN5/KEY6			
34	P60	G15	OUT	H	NARROW LED OUT	74	P47	CIN4/KEY7			
35	P61	G14	OUT	H	WIDE LED OUT	75	P50	CIN3	IN		KEY4
36	P62	G13	OUT	H	ANT B LED OUT	76	P51	CIN2	IN		KEY3
37	P63	G12	OUT	H	ANT A LED OUT	77	P52	CIN1	IN		KEY2
38	P64	G11	OUT	L	STANDBY LED OUT	78	P53	CIN0	IN		KEY1
39	P65	G10	OUT	H	LED OUT	79	P54		IN		GYRO B
40	P66	G9	OUT	H	1G	80	P55	PWM/PDO	IN		GYRO A

JAPAN :
AM STEREO :
EUROPE LW :
AUTO/MANU switch :
STANDBY switch :

Input terminals for initial setting SWs

Initial Setting SW	Level at Each Port	
	LOW (0V)	HI (5V)
JAPAN	Europe or USA	Japan
AM STEREO	Not used	Used
EUROPE LW	Used	Not used
AUTO/MANU	Used	Not used
STANDBY	Not used	Used

Europe or USA (LC7218 IN1 = Pin 8)	LOW	HI
	Europe (MW 9 kHz)	USA (AM 10 kHz)

Note: This terminal is disabled when the Japan destination is selected.

*** PLL IC port description (PLL IC: LC7218)**

OUT0 : MUTE signal output terminal (Active:[L])
OUT1 : MONO signal output terminal (Active:[H])
OUT2 : STRQ signal output terminal (Active: [H])
OUT3 : STEREO CONT. signal output terminal (Active: [L])
Outputs the forced monaural signal for the AM stereo decoder.
OUT4 : MW (AM) band switching signal output terminal (Active: [L])
OUT5 : FM band switching signal output terminal (Active: [L])
OUT6 : LW band switching signal output terminal (Active: [L]) or AM AGC CONT. signal output terminal (Note: Only when the initial setting is EUROPE LW = Not used).

			Port Output			
			BAND Position			
			FM	MW (AM)		LW
				AM STEREO		
Port No.		Port Name		With	With out	
OUT0	9	MUTE	1/0	1/0	1/0	1/0
OUT1	10	MONO	1/0	1/0	0	0
OUT2	11	STRQ	1/0	1/0	1/0	1/0
OUT3	12	ST CON	1	1/0	1	1
OUT4	13	MW	1	0	0	1
OUT5	14	FM	0	1	1	1
OUT6	17	LW/AM AGC	1	1/0	1/0	0

FTD INDICATOR

Terminal		10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
Name	Pin No.	50	51	52	53	54	55	56	57	58	59
Sa	13	a	(3)	a	a	a	a	a	a	a	a
Sb	12	b	(2)	b	b	b	b	b	b	b	b
Sc	8	c	STEREO	c	c	c	c	c	c	c	c
Sd	7	d	MONO	d	d	d	d	d	d	d	d
Se	9	e	(MUTING)	e	e	e	e	e	e	e	
Sf	11	f	(1)	f	f	f	f	f	f	f	f
Sg	10	g	(TIMER)	g	g	g	g	g	g	g	g
Sh	6	h	TUNING	h	h	h	h	h	h	h	h
Sj	5	j	AUTO	j	j	j	j	j	j	j	j
Sk	4	k	-	k	k	k	k	k	k	k	k
Sm	3	m	-	m	m	m	m	m	m	m	m
Sn	2	n	-	n	n	n	n	n	n	n	n
Sp	63	p	-	p	p	p	p	p	p	p	p
Sr	62	r	-	r	r	r	r	r	r	r	r
S15	61	PRESET	TUNED	-	-	-	-	-	Dp	-	MHz
S16	60	MEMORY	-	-	-	-	-	-	-	-	kHz

9. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTORS

R＊＊＊ : 1) GD05 x x x 140, Carbon film fixed resistor, ±5% 1/4W
R＊＊＊ : 2) GD05 x x x 160, Carbon film fixed resistor, ±5% 1/6W
① Resistance value

Examples
① Resistance value

0.1 Ω 001	10 Ω 100	1k Ω.. 102	100k Ω 104
0.5 Ω 005	18 Ω 180	2.7k Ω.. 272	680k Ω 684
1 Ω 010	100 Ω 101	10k Ω.. 103	1M Ω 105
6.8 Ω 068	390 Ω 391	22k Ω.. 223	4.7M Ω 475

Note : Please distinguish 1/4W from 1/6W by the shape of parts used actually.

CAPACITORS

C＊＊＊ : CERAMIC CAP.
3) DD1 x x x x 370, Ceramic capacitor
Disc type
Temp.coeff. P350~N1000, 50V
③ Capacity value
② Tolerance

Examples
② Tolerance (Capacity deviation)
± 0.25 pF 0
± 0.5 pF 1
± 5 % 5
＊ Tolerance of COMMON PARTS handled here are as follows :
0.5 pF - 5 pF ..... ± 0.25 pF
6 pF - 10 pF ..... ± 0.5 pF
12 pF - 560 pF ... ± 5 %
③ Capacity value

0.5 pF 005	3 pF 030	100 pF 101
1 pF 010	10 pF 100	220 pF 221
1.5 pF 015	47 pF 470	560 pF 561

C＊＊＊ : CERAMIC CAP.
4) DK16 x x x 300, High dielectric constant ceramic capacitor
Disc type
Temp.chara. 2B4, 50V
④ Capacity value

Examples
④ Capacity value

100 pF 101	1000 pF 102	10000 pF 103
470 pF 471	2200 pF 222	

C＊＊＊ : 5) ELECTROLY CAP.(⏚), 6)FILM CAP (⏤)
5) EA x x x x x x 10, Electrolytic capacitor
One-way lead type,Tolerance ±20%
⑥ Working voltage
⑤ Capacity value

Examples
⑤ Capacity value

0.1μ F 104	4.7μ F 475	100μ F 107
0.33μ F 334	10μ F 106	330μ F 337
1μ F 105	22μ F 226	1100μ F 118
		2200μ F 228

⑥ Working voltage

6.3 V. . .006	25 V. . .025
10 V. . .010	35 V. . .035
16 V. . .016	50 V. . .050

6) DF15 x x x 350 → Plastic film capacitor
DF15 x x x 310 → One-way type, Mylar ±5% 50V
DF16 x x x 310 → Plastic film capacitor
One-way type, Mylar ±10% 50V
⑦ Capacity value

Examples
⑦ Capacity value

0.001μF (1000pF) 102	0.1μF 104
0.0018μF 182	0.56μF 564
0.01μF 103	1μF 105
0.015μF 153	

NOTE :1) The above CODES(R＊＊＊,R＊＊＊,C＊＊＊,C＊＊＊ and C＊＊＊) are omitted on the schematic diagram in some case.
2) On the occasion, be confirmed the common parts on the parts list.
3) Refer to "Common Parts List" for the other common parts**(RI05, DD4, DK4)**.

NOTE ON SAFETY FOR FUSIBLE RESISTOR :

The suppliers and their type numbers of fusible resistors are as follows ;
1 . KOA Corporation

Part No.(MJI)	Type No.(KOA)	Description
NH05 x x x 140	→ RF25S x x x x Ω J	(±5% 1/4W)
NH05 x x x 120	→ RF50S x x x x Ω J	(±5% 1/2W)
NH85 x x x 110	→ RF73B2A x x x x Ω J	(±5% 1/10W)
NH95 x x x 140	→ RF73B2E x x x x Ω J	(±5% 1/4W)

＊ Resistance value Resistance value(0.1 Ω- 10k Ω)

2. Matsushita Electronic Components Co., Ltd

Part No.(MJI)	Type No.(MEC)	Description
NF05 x x x 140	→ ERD-2FCJ x x x	(±5% 1/4W)
RF05 x x x 140		
NF02 x x x 140	→ ERD-2FCG x x x	(±2% 1/4W)
RF02 x x x 140		

＊ Resistance value

Examples
＊ Resistance value

0.1 Ω 001	10 Ω 100	1k Ω.. 102	100k Ω 104
0.5 Ω 005	18 Ω 180	2.7k Ω.. 272	680k Ω 684
1 Ω 010	100 Ω 101	10k Ω.. 103	1M Ω 105
6.8 Ω 068	390 Ω 391	22k Ω.. 223	4.7M Ω 475

ABBREVIATION AND MARKS

ANT.	: ANTENNA	BATT.	: BATTERY
CAP.	: CAPACITOR	CER.	: CERAMIC
CONN.	: CONNECTING	DIG.	: DIGITAL
HP	: HEADPHONE	MIC.	: MICROPHONE
μ -PRO	: MICROPROCESSOR	REC.	: RECORDING
RES.	: RESISTOR	SPK	: SPEAKER
SW	: SWITCH	TRANSF.	: TRANSFORMER
TRIM.	: TRIMMING	TRS.	: TRANSISTOR
VAR.	: VARIABLE	X 'TAL	: CRYSTAL

NOTE ON SAFETY:

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol ⚠ Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

安全上の注意：

⚠ がついている部品は、安全上重要な部品です。必ず指定されている部品番号の部品を使用して下さい。

970926 A.O

(VERS. :VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
			PG02-GYRO CIRCUIT BOARD	
CG51		4822 122 40586	CER. CAP. 10000pF ±20%	DA17103110
QG51		4822 130 11143	PHOTO UNIT GP1A06 2PHASE PHOTOINTERRUPTER	HW10033320
			PS02-μ-COM CIRCUIT BOARD	
			PS02-CAPACITORS	
CG52		4822 126 10364	CER. 100pF ±10%	DA16101110
CG53		4822 126 10364	CER. 100pF ±10%	DA16101110
CG54		4822 124 80087	ELECT 220μF 6.3V	EJ22700610
CS01		4822 126 10935	ELECT 100μF 6.3V	EJ10700610
CS02		4822 122 40586	CER. 10000pF ±20%	DA17103110
CS03		4822 124 90406	BIG ELECT 0.22F	EX22300530
CS04		4822 124 80087	ELECT 220μF 6.3V	EJ22700610
CS05	F,KK /02,U	4822 126 10935	ELECT 100μF 6.3V	EJ10700610
CS06		4822 122 40586	CER. 10000pF ±20%	DA17103110
CS07		4822 122 40586	CER. 10000pF ±20%	DA17103110
CS09		4822 122 40586	CER. 10000pF ±20%	DA17103110
CS10		4822 124 23053	ELECT 1μF 50V	EJ10505010
CS11		4822 122 40586	CER. 10000pF ±20%	DA17103110
CS12		4822 122 40586	CER. 10000pF ±20%	DA17103110
			PS02-SEMICONDUCTORS	
DS01		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
DS02		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
DS03 ∫ DS08		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
DS71 ∫ DS74		4822 130 80326	L.E.D. LT3D8B RED	HI10062320
QS01		4822 209 16174	MICROPROCESSOR TMP87CM71F	HU290JT02F
QS02		4822 130 42594	DIG.TRS. DTC144ES UN4213	BA20002000
QS03			PHOTO UNITRPM6936-V4	HW10004210
QS04		4822 130 61227	DIG.TRS. DTA114ES UN4111	BA10001000
QS05		4822 130 42594	DIG.TRS. DTC144ES UN4213	BA20002000
			PS02-MISCELLANEOUS	
SS01		4822 276 20508	PUSH SW. MEMO	SP01011280
SS02		4822 276 20508	PUSH SW. IF BAND	SP01011280
SS03		4822 276 20508	PUSH SW. ANTENNA A B	SP01011280
SS11		4822 276 20508	PUSH SW. BAND	SP01011280
SS12		4822 276 20508	PUSH SW. AUTO MANU	SP01011280
SS21		4822 276 20508	PUSH SW. MONO ST	SP01011280
SS22		4822 276 20508	PUSH SW. TUNING	SP01011280
SS23		4822 276 20508	PUSH SW. PRESET	SP01011280
SS24	/02	4822 276 20508	PUSH SW. PTY	SP01011280
SS31		4822 276 20508	PUSH SW. DISPLAY RDS	SP01011280
SS32		4822 276 20508	PUSH SW. CHAR	SP01011280
VS01		4822 130 91282	DISPLAY UNIT FIP12BM8R	HQ31106060
XS01		4822 242 72066	SERAMVIB. CST8.0MHz MT	FQ08004010
			P102-TUNER CIRCUIT BOARD	
			P102-CAPACITORS	
CA01		4822 125 50384	TRIMMING 20pF	CT12000200
CA02		4822 122 40589	CER. 0.047μF ±20%	DA17473110
CA03		4822 122 31823	CER. 15pF ±5% 50V	DD15150300

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
CA04		4822 122 32027	CER. 56pF ±5% 50V	DD15560300
CA05		4822 121 42466	FILM 390pF ±5% 100V	DF15391550
CA06		4822 122 40586	CER. 0.01μF ±20% 25V	DA17103110
CA07	/02	4822 122 40586	CER. 10000pF ±20%	DA17103110
CA08	/02	4822 125 50384	TRIMMING 20pF	CT12000200
CA09	/02	4822 122 31823	CER. 15pF ±5% 50V	DD15150300
CA10		4822 124 90352	ELECT. 10μF ±20% 16V	OA10601620
CA11	/02	4822 122 31349	CER. 68pF ±5% 50V	DD15680300
CA12	/02	4822 122 10367	CER. 150pF ±5% 50V	DD15151300
CA13	/02	4822 122 40586	CER. 10000pF ±20%	DA17103110
CA14	/02	4822 122 40586	CER. 10000pF ±20%	DA17103110
CA15		4822 122 40586	CER. 10000pF ±20%	DA17103110
CA16		4822 122 40588	CER. 0.022μF ±20%	DA17223110
CA17		4822 124 41543	ELECT 1μF ±20% 50V	OA10505020
CA18		4822 124 41543	ELECT 1μF ±20% 50V	OA10505020
CA20		4822 124 90351	ELECT 0.1μF ±20% 50V	OA10405020
CA21		4822 126 10363	CER. 68pF ±5% 50V	DA15680110
CA22		4822 122 40586	CER. 10000pF ±20%	DA17103110
CA23		4822 124 90352	ELECT 10μF ±20% 16V	OA10601620
CA24		4822 122 40586	CER. 10000pF ±20%	DA17103110
CA25		4822 124 90352	ELECT 10μF ±20% 16V	OA10601620
CA27		4822 124 90352	ELECT 10μF ±20% 16V	OA10601620
CA28		4822 122 40586	CER. 10000pF ±20%	DA17103110
CA31 ∫ CA36		4822 122 40586	CER. 10000pF ±20%	DA17103110
CA37		4822 122 33792	CER. 10pF ±5%	DA15100120
CA38		4822 122 40586	CER. 10000pF ±20%	DA17103110
CA51	F	4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
CA53	F	4822 124 90352	ELECT. 10μF ±20% 16V	OA10601620
CA54	F	4822 124 90352	ELECT. 10μF ±20% 16V	OA10601620
CA55	F	4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
CA56	F	4822 122 40588	CER. 0.022μF ±20% 25V	DA17223110
CA63	F	4822 124 22273	ELECT 0.47μF ±20% 50V	OA47405020
CA64	F	4822 124 90352	ELECT. 10μF ±20% 16V	OA10601620
CA66	F	4822 122 40586	CER. 10000pF ±20%	DA17103110
CA67	F	4822 122 31205	CER. 47pF ±5% 50V	DD15470300
CA68	F	4822 124 41543	ELECT 1μF ±20% 50V	OA10505020
CA69	F	4822 124 90358	ELECT 22μF ±20% 16V	OA22601620
CA70	F	4822 124 41539	ELECT 47μF ±20% 16V	OA47601620
CA71	F	4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
CA72	F	4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
CA73	F	4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
CA75	F	4822 124 41543	ELECT 1μF ±20% 50V	OA10505020
CA76	F	4822 124 41543	ELECT 1μF ±20% 50V	OA10505020
CA78	F	4822 124 90354	ELECT 100μF ±20% 16V	OA10701620
CA79	F	4822 122 40586	CER. 0.01μF ±20% 25V	DA17103110
CA80	F	4822 122 40586	CER. 0.01μF ±20% 25V	DA17103110
CA81	F	4822 122 40586	CER. 0.01μF ±20% 25V	DA17103110
CH01			FILM 220pF ±5% 100V PP	OF15221540
CH02			FILM 220pF ±5% 100V PP	OF15221540
CH03		4822 124 22241	ELECT 47μF 16V	OA47601650
CH04		4822 124 22241	ELECT 47μF 16V	OA47601650
CH07		4822 124 22241	ELECT 47μF 16V	OA47601650
CH08		4822 124 22241	ELECT 47μF 16V	OA47601650
CH11		4822 124 23514	ELECT 100μF 16V	OA10701650
CH12		4822 124 23514	ELECT 100μF 16V	OA10701650
CH13		4822 124 22039	ELECT 220μF 16V	OA22701650
CH14		4822 124 22039	ELECT 220μF 16V	OA22701650
CH15		5322 122 32143	CER. 22pF ±5% 50V	DD15220300
CH16		5322 122 32143	CER. 22pF ±5% 50V	DD15220300

(VERS. :VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
C101		4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
C102		4822 122 40586	CER. 10000pF ±20%	DA17103110
C103		4822 122 33639	CER. 1000pF ±10%	DA16102110
C104		4822 122 40586	CER. 10000pF ±20%	DA17103110
C105		4822 122 33639	CER. 1000pF ±10%	DA16102110
C106				
∫		4822 122 40586	CER. 10000pF ±20%	DA17103110
C110				
C120		4822 122 40586	CER. 10000pF ±20%	DA17103110
C201				
∫		4822 122 40586	CER. 10000pF ±20%	DA17103110
C206				
C207		4822 122 31349	CER. 68pF ±5% 50V	DD15680300
C208				
∫		4822 122 40586	CER. 10000pF ±20%	DA17103110
C216				
C221	/02	4822 124 90352	ELECT 10µF ±20% 16V	OA10601620
C222	/02	4822 122 40586	CER. 10000pF ±20%	DA17103110
C230		4822 122 40586	CER. 10000pF ±20%	DA17103110
C231		4822 122 40586	CER. 10000pF ±20%	DA17103110
C253		4822 122 40588	CER. 0.022µF ±20%	DA17223110
C254		4822 122 40588	CER. 0.022µF ±20%	DA17223110
C255		4822 124 90352	ELECT 10µF ±20% 16V	OA10601620
C256		4822 122 40588	CER. 0.022µF ±20%	DA17223110
C257		4822 124 90353	ELECT 100µF 10V	OA10701020
C258		4822 124 22273	ELECT 0.47µF ±20% 50V	OA47405020
C259		5322 122 32336	FILM 560pF ±5% 50V	DF15561350
C260		4822 126 10363	CER. 68 pF ±5% 50V	DA15680110
C261		4822 122 40588	CER. 0.022µF ±20%	DA17223110
C262		4822 124 90354	ELECT 100µF ±20% 16V	OA10701620
C264		4822 122 40588	CER. 0.022µF ±20%	DA17223110
C281		4822 122 40586	CER. 10000pF ±20%	DA17103110
C282		4822 122 40586	CER. 10000pF ±20%	DA17103110
C283		4822 122 40586	CER. 10000pF ±20%	DA17103110
C301		4822 124 90359	ELECT 22µF 16V	OA22601650
C302		4822 124 23514	ELECT 100µF 16V	OA10701650
C303		4822 122 33639	CER. 1000pF ±10% 50V	DA16102110
C305		4822 124 41543	ELECT 1µF ±20% 50V	OA10505020
C306		4822 124 90352	ELECT 10µF ±20% 16V	OA10601620
C307		4822 124 22696	ELECT 3.3µF ±20% 50V	OA33505020
C308		4822 124 22273	ELECT 0.47µF ±20% 50V	OA47405020
C309	F,K /02,U		FILM 470pF ±5% 100V	OF55471530
C309	KK		FILM 560pF ±5% 100V	OF55681530
C310	F,K /02,U		FILM 470pF ±5% 100V	OF55471530
C310	KK		FILM 560pF ±5% 100V	OF55681530
C315	/02		FILM 100pF ±5% 100V	OF55101530
C316	/02		FILM 100pF ±5% 100V	OF55101530
C319		4822 122 40586	CER. 0.01µF ±20% 25V	DA17103110
C323		4822 124 22039	ELECT 220µF 16V	OA22701650
C324		4822 124 22039	ELECT 220µF 16V	OA22701650
C351	/02	4822 122 40586	CER. 10000pF ±20%	DA17103110
C352	/02	4822 124 90352	ELECT 10µF ±20% 16V	OA10601620
C353	/02	4822 126 11071	CER. 330pF ±10%	DA16331110
C354	/02	4822 126 10409	CER. 560pF ±10%	DA16561110
C355	/02	4822 122 40586	CER. 10000pF ±20%	DA17103110
C356	/02	4822 122 31823	CER. 15pF ±5% 50V	DD15150300
C357	/02	4822 122 31823	CER. 15pF ±5% 50V	DD15150300
C358	/02	4822 124 90352	ELECT 10µF ±20% 16V	OA10601620
C359	/02	4822 124 90352	ELECT 10µF ±20% 16V	OA10601620
C360	/02	4822 122 33639	CER. 1000pF ±10%	DA16102110

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
C361				
∫	/02	4822 126 10364	CER. 100pF ±10%	DA16101110
C364				
C501		4822 122 31205	CER. 47pF ±5% 50V	DD15470300
C502		4822 122 31205	CER. 47pF ±5% 50V	DD15470300
C503		4822 124 90354	ELECT 100µF ±20% 16V	OA10701620
C504		4822 122 40586	CER. 0.01µF ±20% 25V	DA17103110
C505		4822 124 90351	ELECT 0.1µF ±20% 50V	OA10405020
C506		4822 124 41543	ELECT 1µF ±20% 50V	OA10505020
C507		4822 122 40586	CER. 0.01µF ±20% 25V	DA17103110
C521		4822 122 40586	CER. 0.01µF ±20% 25V	DA17103110
C522		4822 122 40586	CER. 0.01µF ±20% 25V	DA17103110
C523		4822 122 40586	CER. 0.01µF ±20% 25V	DA17103110
C801		4822 122 30043	CER. 0.01µF +80%-20% 50V	DK18103310
C802		4822 122 30043	CER. 0.01µF +80%-20% 50V	DK18103310
C803			ELECT 1000µF 35V	OA10803550
C804			ELECT 1000µF 35V	OA10803550
C805		4822 124 41539	ELECT 47µF ±20% 16V	OA47601620
C806		4822 124 41539	ELECT 47µF ±20% 16V	OA47601620
C807		4822 124 22241	ELECT 47µF 16V	OA47601650
C808		4822 124 22241	ELECT 47µF 16V	OA47601650
C809		4822 124 22695	ELECT 2200µF ±20% 35V	OA22803520
C810		4822 124 41539	ELECT 47µF ±20% 16V	OA47601620
C811		4822 122 30043	CER. 0.01µF +80%-20% 50V	DK18103310
C812		4822 124 23913	ELECT 2200µF 16V	OA22801620
C813		4822 124 90351	ELECT 0.1µF ±20% 50V	OA10405020
C814		4822 124 90354	ELECT 100µF ±20% 16V	OA10701620
C815		4822 122 30043	CER. 0.01µF +80%-20% 50V	DK18103310
C816		4822 124 90355	ELECT 100µF ±20% 50V	OA10705020
C817		4822 124 90355	ELECT 100µF ±20% 50V	OA10705020
C818		4822 122 30043	CER. 0.01µF +80%-20% 50V	DK18103310
C821		4822 122 40586	CER. 10000pF ±20%	DA17103110
C831		4822 124 41539	ELECT 47µF ±20% 16V	OA47601620
C841		4822 124 41539	ELECT 47µF ±20% 16V	OA47601620
C842		4822 124 41539	ELECT 47µF ±20% 16V	OA47601620
U025		4822 126 10364	CER. 100pF ±10%	DA16101110
			P102-CAPACITORS(COMMON)	
C***			PLASTIC FILM CAPACITOR ±5% 50V : (CA19 [OTHER K]) (CA65 [F]) C304	
C***			HIGH DIELECTRIC CONSTANT CERAMIC CAPACITOR ±10% 50V : (CA57-CA62 [F]) (C317 C318[K])	
			P102-RESISTORS	
RH19		4822 052 10101	100Ω ±5% 1/6W	GG05101160
RH20		4822 052 10101	100Ω ±5% 1/6W	GG05101160
RH21		4822 052 10101	100Ω ±5% 1/6W	GG05101160
RH22		4822 052 10101	100Ω ±5% 1/6W	GG05101160
R218		4822 100 20681	2.2kΩ TRIMMING	RA0222O780
R257		4822 100 11471	100kΩ TRIMMING	RA0104O780
R303		4822 100 11471	100kΩ TRIMMING	RA0104O780
R343		4822 100 11641	470kΩ TRIMMING	RA0474O780
⚠ R801		4822 113 90107	4.7Ω ±5% 1/4W FUSIBLE	NH05047140
⚠ R802		4822 113 90107	4.7Ω ±5% 1/4W FUSIBLE	NH05047140
⚠ R803		4822 111 90967	4.7kΩ ±5% 1/4W FUSE	NF05047140
⚠ R804		4822 111 90967	4.7kΩ ±5% 1/4W FUSE	NF05047140
⚠ R813		4822 050 26801	680Ω ±5% 1/4W	GG05681140
R846		4822 050 21022	1kΩ ±5% 1/4W	GG05102140

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POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
			P102-RESISTORS (COMMON)	
R***			CARBON FILM FIXED RES. ±5% 1/6W : DH11 DH12 RA01 RA02 (RA03 RA04 RA06-RA11 [/02]) RA12-RA15 RA17 RA18 (RA19 RA20 [/02]) RA21 (RA51 RA53-RA67 RA69-RA72 RA73-RA75 RA77 [F]) RG51-RG53 RH01-RH12 RH15-RH18 RH25-RH28 RH31-RH36 RH39 RH40 (RH41 RH42 [OTHER F]) RS10-RS13 RS20-RS23 RS30 RS32 RS41 (RS42 [/02]) (RS63 RS65 [F,K, KK,U]) RS66 (RS71 RS72 [F]) (RS73 [F,K,KK,U,]) RS91-RS94 R101-R118 R201-R217 R219-R232 R251-R253 R255 (R258 [/02]) R261 R262 R268 R273-R277 R280-R284 R286 R287 R301 R302 R304 R307-R310 R315-R326 (R327 R328 [F,K,KK,U,]) (R331 [K]) R341 R342 (R352 [/02]) R501-R506 R521 R522 R805 R806 R814-R816 R830 R831 R833 R841 R843 R845	
R***			CARBON FILM FIXED RES. ±5% 1/4W : (R233 [/02]) R254	
			P102-SEMICONDUCTORS	
DA01		4822 125 50416	VARI SVC342-L	HD40009030
DA02	/02	4822 130 33697	DIODE 1SS135	HD20017210
DA03	/02	4822 125 50416	VARI SVC342-L	HD40009030
DA04	/02	4822 130 33697	DIODE 1SS135	HD20017210
DA05		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
DA06		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
DH01				
⟆		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
DH10				
DH13		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
DH14		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
D101				
⟆		4822 130 33697	DIODE 1SS135	HD20017210
D111				
D201				
⟆		4822 130 33697	DIODE 1SS135	HD20017210
D204				
D301		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
D302		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
⚠ D801				
⟆		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D804				
⚠ D810				
⟆		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D814				
⚠ D815		4822 130 82474	ZENER DIODE RD20JB2 MTZJ20C	HD32001000

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
⚠ D816		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D817		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D821		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D822		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D823		4822 130 80623	ZENER DIODE RD13JB2 MTZJ13B	HD31301000
⚠ D824		4822 130 80623	ZENER DIODE RD13JB2 MTZJ13B	HD31301000
D830		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
D831		4822 130 32362	DIODE 1SS176 MA165 1SS254 30V 0.1A	HD20002000
⚠ D841		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
⚠ D842		4822 130 80319	ZENER DIODE RD9.1JB2 MTZJ9.1C	HD30911000
⚠ D843		4822 130 82421	DIODE 1D3 1A 200V	HD20002710
QA01	/02	4822 130 41947	TRS. 2SC536SP 2SC2458 2SC3311 2SC1740S	HT30001000
QA02	/02	4822 130 41947	TRS. 2SC536SP 2SC2458 2SC3311 2SC1740S	HT30001000
QA03	/02	4822 130 61892	TRS. 2SD2144S U V	HT421442A0
QA04		4822 130 61227	DIG.TRS. DTA114ES UN4111	BA10001000
QA05	/02	4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
QA06	/02	4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
QA51	F		IC MC13022P AM STEREO	HC10078170
QA52	F	4822 130 41947	TRS. 2SC536SP 2SC2458	HT30001000
QA53	F	4822 130 42594	DIG.TRS. DTC144ES UN4213	BA20002000
QH03		4822 130 43233	TRS. 2SC2240 GR BL	HT322402A0
QH04		4822 130 43233	TRS. 2SC2240 GR BL	HT322402A0
QH05				
⟆		4822 130 42949	TRS. 2SA970 GR BL	HT109702A0
QH08				
QH09				
⟆		4822 130 43233	TRS. 2SC2240 GR BL	HT322402A0
QH16				
QH17		4822 130 42949	TRS. 2SA970 GR BL	HT109702A0
QH18		4822 130 42949	TRS. 2SA970 GR BL	HT109702A0
Q201		4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
Q203				
⟆		4822 130 62294	TRS. 2SC1809S P	HT318091P0
Q209				
Q252		4822 209 71785	IC LA1266 FM AM IF	HC10222030
Q258	/02	4822 130 41947	TRS. 2SC536SP 2SC2458 2SC3311 2SC1740S	HT30001000
Q275		4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
Q276		4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
Q277		4822 130 41947	TRS. 2SC536SP 2SC2458 2SC3311 2SC1740S	HT30001000
Q281		4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
Q282		4822 130 60495	TRS. 2SA1309A Q R	HT113092C0
Q283		4822 130 41947	TRS. 2SC536SP 2SC2458 2SC3311 2SC1740S	HT30001000
Q301		4822 209 70261	IC LA3410 FM MPX	HC10198030
Q303		4822 130 42594	DIG.TRS. DTC144ES UN4213	BA20002000
Q304		4822 130 61227	DIG.TRS. DTA114ES UN4111	BA10001000
Q305				
⟆		4822 130 43818	TRS. 2SC2878 A BRANK	HT323782A0
Q308				
Q309	/02	4822 130 41947	TRS. 2SC536SP 2SC2458	HT30001000
Q341		4822 130 43818	TRS. 2SC2878 A BRANK	HT323782A0

(VERS. :VERSION, U:U.S.A., F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
Q351	/02		IC LC72720 RDS DECODER	HC10385030
Q501		4822 209 30178	IC LC7218 PLL	HC10221030
Q502		4822 130 42121	F.E.T. 2SK30ATM Y1	HF200300B0
Q503		4822 130 41947	TRS. 2SC536SP 2SC2458 2SC3311 2SC1740S	HT30001000
⚠ Q801		5322 130 41842	TRS. 2SD1827 +12V AF	HT418271A0
⚠ Q802		4822 130 62704	TRS. 2SB1225 -12V AF	HT212251A0
⚠ Q807		4822 209 60826	IC NJM7812FA +12V 1A	HC38912090
Q811		4822 209 70385	IC 78MR05 5V 0.5A REG.	HC10205030
Q830		4822 130 42594	DIG.TRS. DTC144ES UN4213	BA20002000
Q831		4822 130 41947	TRS. 2SC536SP 2SC2458	HT30001000
⚠ Q841		4822 130 61892	TRS. 2SD2144 U OR V +8V	HT421442A0
Q843		4822 130 41947	TRS. 2SC536SP 2SC2458	HT30001000
			P102-MISCELLANEOUS	
A101	F		VHF TUNER FM FRONT END FE407-J49	AV01201070
A101	K,KK /02,U	4822 210 10372	VHF TUNER FE415-G09	AV01202210
FA01		4822 242 81262	CER. FILTER SFP450 F	FF10045390
F201	F,K KK,U	4822 242 72345	CER. FILTER SFE10.7MX2-A	FF11070660
F201	/02	4822 242 70911	CER. FILTER SFE10.7MA8-A	FF11070610
F202	F,K KK,U	4822 242 70665	CER. FILTER SFE10.7MS3-A	FF11070620
F202	/02	4822 242 72346	CER. FILTER SFE10.7MZ2-A	FF11070670
F203		4822 242 70911	CER. FILTER SFE10.7MA8-A	FF11070610
F204		4822 242 72345	CER. FILTER SFE10.7MX2-A	FF11070660
G501		4822 111 92204	COMPO. NETWORK 10kΩ x5	BW05103240
J101	F,U	4822 264 10371	TERMINAL YKD31-0468 FM ANTF 1P	YT01010350
J101	K,KK /02		TERMINAL YKD31-0442 FM ANT 1P	YT02011080
J102	F,U	4822 290 81537	TERMINAL YKD31-0426 FM AM ANT F	YT01030080
J102	K,KK /02	4822 290 81632	TERMINAL YKD31-0215A FM AM ANT PAL	YT03030020
J301		4822 290 81598	TUNER OUTPUT TERMINAL L R GL	YT02021130
LA01		4822 157 63084	AM ANT COIL	LA10295170
LA02		4822 157 70779	AM OSC COIL	LO70013010
LA03	/02	4822 157 52714	LW ANT COIL FOR LA1267	LA10295160
LA04	/02	4822 157 70781	LW OSC COIL	LO70013020
LA05		4822 157 53589	CHOKE COIL 39 MH	LC23960710
LA06		4822 148 81095	I.F.T. COIL AM IFT	LI70033510
LA51	F		I.F.T. COIL A7NRES-T1370Y 450KHz	LI71010120
LA52	F	4822 148 81095	I.F.T. COIL AM IFT K7-H5	LI70033510
L101 ∫ L106		4822 157 62911	CHOKE COIL LAL02TA3R3J 3.3µH	LC13323800
L201		4822 157 11493	I.F.T. COIL FM NAR.DIST IFT-41K7-H5	LI74018040
L251		4822 157 62408	I.F.T. FM DET COIL 134-5109-01	LI70379040
L252		4822 157 62409	I.F.T. FM DET COIL 134-5110-01	LI70379050
L253		4822 156 10794	M.P.X. COIL ANTIBIRDE FILTER	LS10295030

POS. NO	VERS. COLOR	PART NO. (FOR PCS)	DESCRIPTION	PART NO. (MJI)
L301		4822 157 70021	M.P.X. COIL FM19 38 KHz	LS10293010
L302		4822 157 70021	M.P.X. COIL FM19 38 KHz	LS10293010
L350 ∫ L359	/02	4822 157 62911	CHOKE COIL LAL02TA3R3J 3.3µH	LC13323800
S101		4822 277 21712	SLIDE SW. FM RF ATT	SS02021470
S301	/02	4822 277 21712	SLIDE SW. 9K 10KHz DE.EMPHASIS	SS02021470
XA51	F		SERAMVIB. CSA3.60MFG103	FQ03604020
X301		4822 242 81117	SERAMVIB. CSB456F11 FOR LA3410	FQ04563010
X351	/02	4822 242 10857	CRYSTAL 4.332MHZ X.TAL FOR RDS DEMO IC	JX04003260
X501		4822 242 72333	CRYSTAL 7.2MHZ	JX07001260
			P802-TRANSF. CIRCUIT BOARD	
L801	F		POWER TRANSFORMER (100V 50Hz 60Hz)	TS15743020
⚠ L801	K, U		POWER TRANSFORMER (115V 230V 50Hz)	TS15743030
⚠ L801	KK, /02	4822 146 10932	POWER TRANSF. 230V 50HZ	TS15743010
			P852-POWER SW. CIRCUIT BOARD	
⚠ C851		4822 122 33276	CER. CAP. 0.01µF ±20% 250V	DK17103840
⚠ S851		4822 276 13364	PUSH POWER SW. SDDLD1214A TV-3	SP01011990
⚠ S852	/02	4822 277 21825	SLIDE SW. VOL.SEL. SDKGA4	SS02021510